

What is Claimed is:

1. A gastric stimulation device comprising:
  - a housing;
  - 5        electronic circuitry contained within the housing;
  - at least one stimulating electrode coupled to the housing and electrically  
coupled to the electronic circuitry; and
  - an attachment device coupled to the housing and operative to attach said  
housing within a stomach cavity to a stomach wall so that said at least one
  - 10       stimulating electrode is in electrical contact with the stomach wall;
  - wherein said electronic circuitry is configured to deliver electrically  
stimulating signals to the stomach through the at least one stimulating electrode.
2. The gastric stimulation device of claim 1, wherein said attachment device
- 15       comprises an anchor having a first portion arranged to extend into the stomach  
wall when said anchor is attached to the stomach wall.
3. The gastric stimulation device of claim 2 wherein when said attachment device  
is deployed, said first portion extends through said stomach wall in an orientation
- 20       substantially perpendicular to said stomach wall.
4. The gastric stimulation device of claim 2 wherein said attachment device  
further comprises at least one lateral extending member arranged to be deployed  
to extend laterally of the attachment device within the stomach wall.
- 25       5. The gastric stimulation device of claim 4 wherein said at least one laterally  
extending member is configured to secure the attachment device to the stomach  
wall.
- 30       6. The gastric stimulation device of claim 4 wherein said at least one laterally  
extending member comprises an electrode located thereon.

7. The gastric stimulation device of claim 4 wherein said at least one laterally extending member comprises a strain gauge located thereon.
8. The gastric stimulation device of claim 6 wherein said laterally extending member is adjustable.
9. The gastric stimulation device of claim 4 wherein said at least one laterally extending member comprises a plurality of laterally extending members.
10. The gastric stimulation device of claim 9 wherein each of said plurality of laterally extending members comprises an electrode thereon.
11. The gastric stimulation device of claim 9 wherein said plurality of laterally extending members are selectably adjustable with respect to one another to vary the distance between each of said electrodes.
12. The gastric stimulation device of claim 2 wherein said attachment device further comprises a distal portion wherein when said attachment device is deployed, said distal portion extends through said stomach wall, adjacent an outer surface of the stomach wall.
13. The gastric stimulation device of claim 2 wherein said at least one electrode is located on said first portion of said anchor.
14. The gastric stimulation device of claim 13 wherein said at least one electrode is arranged on said first portion so that said at least one electrode is located within the stomach wall when said anchor is attached to the stomach wall.
15. The gastric stimulation device of claim 2, wherein said anchor is permanently fixed to said housing.
16. The gastric stimulation device of claim 2, wherein said anchor is removably attachable to said housing.

17. The gastric stimulation device of claim 1, wherein said attachment device comprises a release mechanism operative to release an attached stimulator.
- 5 18. The gastric stimulation device of claim 1 wherein said stimulator comprises a release mechanism operative to release the stimulator from the attachment device.
19. The gastric stimulation device of claim 1 wherein said attachment device comprises a release mechanism operative to release said attachment device from
- 10 engagement with the stomach wall.
20. The gastric stimulation device of claim 2 wherein said anchor comprises: an expandable distal portion adjacent to said first portion, said expandable distal portion arranged to secure the attachment device to the stomach wall.
- 15 21. The gastric stimulation device of claim 20 wherein said expandable distal portion comprises a spring mechanism biased in an expanded position.
22. The gastric stimulation device of claim 20 wherein said expandable distal
- 20 portion comprises an inflatable member.
23. The gastric stimulation device of claim 22 further comprising an inflation medium for inflating said inflatable member
- 25 24. The gastric stimulation device of claim 22 wherein said inflatable medium comprises a curable polymer
25. The gastric stimulation device of claim 22 wherein said inflatable member is inflatable to a predetermined pressure
- 30 26. The gastric stimulation device of claim 22 wherein said inflatable member in inflatable to a predetermined volume

27. The gastric stimulation device of claim 20 wherein said at least one electrode is located on said expandable distal portion.
28. The gastric stimulation device of claim 20 wherein said expandable distal portion further comprises an antibiotic material coated on at least a portion of said expandable distal portion.
29. The gastric stimulation device of claim 2 wherein said first portion comprises a distal end having a sharp tip located thereon.
30. The gastric stimulation device of claim 29 wherein said tip comprises a bioabsorbable material.
31. The gastric stimulation device of claim 1, wherein said at least one electrode is located on said housing.
32. The gastric stimulation device of claim 1 wherein said at least one electrode is coupled to said housing.
33. The gastric stimulation device of claim 1, wherein said at least one electrode is located on said attachment device.
34. The gastric stimulation device of claim 1 wherein said at least one electrode is coupled to said attachment device.
35. The gastric stimulation device of claim 1, wherein said at least one electrode comprises a first and second bipolar electrode, said first electrode being electrically opposite of said second electrode.
36. The gastric stimulation device of claim 35, wherein said first electrode is located on said attachment device and said second electrode is located on said housing.

37. The gastric stimulation device of claim 35 wherein said first electrode is coupled to said attachment device and wherein said second electrode is coupled to said housing.
- 5 38. The gastric stimulation device of claim 35, wherein said first and second electrodes are located on said housing.
39. The gastric stimulation device of claim 35, wherein each of said first and second electrode are coupled to said housing.
- 10 40. The gastric stimulation device of claim 35, wherein said first and second electrodes are located on said attachment device
41. The gastric stimulation device of claim 35, wherein said first and second  
15 electrodes are coupled to said attachment device.
42. The stimulation device of claim 1 wherein said electronic circuitry comprises an electromagnetic coil arranged to receive a telemetry signal from an external device.
- 20 43. The stimulation device of claim 42 wherein said telemetry signal comprises a representative command signal for causing said device to provide electrical stimulation to the stomach wall through said at least one electrode.
- 25 44. The stimulation device of claim 42 further comprising a user operated external device comprising a second electromagnetic coil, said second electromagnetic coil arranged to emit said telemetry signal.
- 30 45. The gastric stimulation device of claim 1 further comprising an external control unit, wherein said external unit is configured to deliver and said electronic circuitry is controlled to receive a control signal controlling the delivery of the electrically stimulating signals.

46. The gastric stimulation device of claim 45 wherein said external control unit further comprises a patient actuatable control device coupled to said external control unit, wherein said patient actuatable control device is configured to instruct the external control unit to transmit said control signal upon patient actuation of  
5 the control device.

47. A gastric stimulation device comprising:  
a housing constructed of a first material resistant to corrosion when located within a stomach environment;  
10 said housing including an electronic circuit within the housing and an electrical connector arranged to electrically couple at least one stimulating electrode to said electronic circuit; and  
a sealing device operative to seal said connector from the stomach environment, wherein said sealing device is constructed of a second material  
15 resistant to corrosion from the stomach environment.

48. The gastric stimulation device of claim 47 wherein said device further comprises  
at least one stimulating electrode coupled to the housing and the electronic  
20 circuit through said connector.

49. The gastric stimulation device of claim 47 further comprising an attachment device coupled to the housing and arranged to secure said housing to the stomach wall from within stomach cavity;  
25 wherein said electronic circuitry is arranged to deliver electrically stimulating signals to the stomach through at least one stimulating electrode.

50. The gastric stimulation device of claim 47 wherein said first and second material are the same.  
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51. The gastric stimulation device of claim 47 wherein said first corrosion resistant material is suitable for long-term use within a stomach.

52. The gastric stimulation device of claim 47 wherein said second corrosion resistant material is suitable for long-term use within a stomach.

53. A gastric stimulation device comprising:

5       a housing constructed of a material resistant to corrosion when located  
within a stomach environment;  
      said housing including an electronic circuit within the housing; and  
      at least one stimulating electrode arranged so that when deployed said at  
least one stimulating electrode is coupled to the housing and is electrically  
10   coupled to the electronic circuit, wherein said electrode is formed of an  
electrically conductive material resistant to corrosion when located within a  
stomach environment, and wherein said electronic circuitry is arranged to deliver  
electrically stimulating signals to the stomach wall through the at least one  
electrode.

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54. The gastric stimulation device of claim 53 wherein said corrosion resistant material is suitable for long-term use within a stomach.

55. The gastric stimulation device of claim 53 wherein said electrically  
20   conductive corrosion resistant material is suitable for long-term use within a  
stomach.

56. A gastric stimulation device comprising an anchor for attaching an electrode to a wall of a stomach, said anchor including:

25       a first portion arranged to extend into the stomach wall, said first portion  
comprising a distal end having a sharp tip located thereon and an expandable  
distal portion arranged to secure the anchor to the stomach wall.

57. The gastric stimulation device of claim 56 wherein said tip comprises a  
30   bioabsorbable material.

58. A gastric stimulation device comprising an anchor for attaching an electrode to a wall of a stomach, said anchor including:

a first portion arranged to extend into the stomach wall from within the stomach so that said electrode is in electrical contact with the stomach wall.

5 59. The stimulation device of claim 58 wherein said first portion comprises a distal portion having an expandable portion arranged to expand to secure the anchor to the stomach wall.

60. The stimulation device of claim 58 wherein the at least one electrode is located on said first portion of the anchor.

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61. The stimulation device of claim 59 wherein said expandable portion is constructed to extend through the stomach wall and to expand adjacent on outer surface of the stomach wall.

15 62. The stimulation device of claim 58 wherein said expandable portion is constructed to extend laterally into the stomach wall.

63. The stimulation device of claim 62 wherein said expandable portion comprises at least one laterally advancing member.

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64. The stimulation device of claim 61 further comprising a bumper arranged to prevent further movement of the first portion through the stomach wall.

25 65. A gastric stimulation device comprising:  
a housing;  
electronic circuitry contained within the housing;  
at least one stimulating electrode coupled to the housing and electrically coupled to the electronic circuitry;  
an attachment device coupled to the housing and arranged to attach said  
30 housing within a stomach cavity to a stomach wall; and  
a sensor coupled to said stimulation device, said sensor operative to sense a parameter indicative of a condition the stomach,



wherein said electronic circuitry is configured to deliver electrically stimulating signals to the stomach through the at least one stimulating electrode.

5 66. The stimulation device of claim 65 wherein said sensor comprises a pH sensing device.

67. The stimulation device of claim 65 wherein said sensor comprises a strain gauge.

10 68. The stimulation device of claim 67 wherein said strain gauge is located on said anchor.

69. The stimulation device of claim 65 wherein said sensor comprises a temperature sensing device.

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70. The stimulation device of claim 65 wherein said sensor comprises said at least one electrode and wherein said electronic circuitry comprises an impedance determining circuit coupled to said at least one electrode.

20 71. The stimulation device of claim 65 wherein said sensor comprises said at least one electrode arranged to sense electrical activity of the stomach wall, and wherein said electronic circuitry further comprises a circuit for determining said condition of the stomach from the electrical activity of the stomach wall sensed by said at least one electrode.

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72. The stimulation device of claim 71 wherein said electronic circuitry comprises a controller coupled to said circuit for determining said condition, and a memory device coupled to said controller, said memory device including a stimulation program, wherein said controller is arranged to cause said at least one  
30 electrode to deliver a stimulation program responsive to said sensed electrical activity.

73. The stimulation device of claim 65 wherein said electronic circuitry comprises:

- 5 a controller coupled to said sensor, wherein said sensor is arranged to provide an electrical signal representative of said sensed information to said controller; and
- a memory device coupled to said controller, said memory device including a stimulation program, wherein said controller is arranged to cause said at least one electrode to deliver the stimulation program responsive to said sensed condition.

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74. The stimulation device of claim 73 wherein said electronic circuitry further comprises a electromagnetic coil arranged to receive an external telemetry signal including the stimulation program from an external programmer for storage in said memory device.

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- 75. The stimulation device of claim 65 wherein said electronic circuit comprises an electromagnetic coil arranged to send a telemetry signal to an external device, said telemetry signal including information representative of the sensed condition, wherein said electromagnetic coil is further arranged to receive a responsive
- 20 telemetry signal from an external device, said responsive telemetry signal including instructions responsive to said information representative of the sensed condition.

76. A gastric stimulation device comprising:

- 25 a housing;
- electronic circuitry contained within the housing;
- at least one stimulating electrode coupled to an electrode anchoring device, said anchoring device arranged to attach the at least one electrode in electrical contact with a stomach wall, wherein said at least one electrode when deployed, is
- 30 electrically coupled to the electronic circuitry; and
- an attachment device coupled to the housing and operative to attach said housing within the stomach to the stomach wall;

wherein said electronic circuitry is configured to deliver electrically stimulating signals to the stomach through the at least one stimulating electrode.

77. The gastric stimulation device of claim 76 wherein said at least one electrode  
5 is electrically coupled to the electronic circuitry by a flexible lead.

78. The gastric stimulation device of claim 77 wherein said at least one electrode is coupled through said attachment device to the electronic circuitry.

10 79. The gastric stimulation device of claim 76 wherein said at least one electrode is coupled through said housing to said electronic circuitry.

80. The gastric stimulation device of claim 76 wherein said anchoring device comprises a first portion arranged when deployed to extend into the stomach wall,  
15 said first portion comprises a distal end having a sharp tip located thereon and an expandable distal portion arranged to secure the anchoring device to the stomach wall.

81. The gastric stimulation device of claim 80 wherein said tip comprises a  
20 bioabsorbable material.

82. An attachment device for attaching a functional device to a stomach wall comprising:

a securing device operative to secure the attachment device to the stomach  
25 wall, said securing device comprising a first portion at least a portion of which is arranged to extend into the stomach wall when said attachment device is attached to the stomach wall;

a coupling device arranged to receive and couple the functional device to the attachment device.

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83. The attachment device of claim 82, wherein said attachment device is removably attachable to the functional device.

84. The attachment device of claim 82 wherein said attachment device further comprises a releasable latching mechanism.
85. The attachment device of claim 82 wherein said coupling device includes a quick release mechanism.
86. The attachment device of claim 82 wherein said first portion is configured to extend through said stomach wall in an orientation substantially perpendicular to said stomach wall.
87. The attachment device of claim 82 wherein said first portion comprises a strain gauge located thereon.
88. The attachment device of claim 82 further comprising at least one lateral extending member arranged to be deployed to extend laterally of the first portion within the stomach wall.
89. The attachment device of claim 88 wherein said at least one laterally extending member is configured to secure the attachment device to the stomach wall.
90. The attachment device of claim 88 wherein said at least one laterally extending member comprises an electrode located thereon.
91. The attachment device of claim 82 wherein said attachment device is removably attachable to said stomach wall.
92. The attachment device of claim 82 further comprising:  
an expandable distal portion coupled to said first portion, said expandable distal portion arranged to secure the attachment device to the stomach wall.

93. The attachment device of claim 92 wherein said further comprising a bumper arranged to engage said attachment device so that said bumper abuts the inner surface of the stomach wall.
- 5 94. The attachment device of claim 92 wherein said expandable distal portion further comprises an antibiotic material coated on at least a portion of said expandable distal portion.
95. The attachment device of claim 92 wherein said expandable distal portion  
10 comprises a spring mechanism biased in an expanded position.
96. The attachment device of claim 92 wherein said expandable distal portion comprises an inflatable member.
- 15 97. The attachment device of claim 96 further comprising:  
an inflation lumen in fluid communication with said inflatable member and an  
inflation medium for inflating said inflatable member.
98. The attachment device of claim 96 wherein said inflation medium comprises a  
20 curable polymer.
99. The attachment device of claim 96 wherein said inflatable member is  
inflatable to a predetermined pressure
- 25 100. The attachment device of claim 96 wherein said inflatable member is  
inflatable to a predetermined volume.
101. The attachment device of claim 88 further comprising a distal portion  
wherein when said attachment device is deployed, said distal portion extends  
30 through said stomach wall, adjacent an outer surface of the stomach wall.
102. The attachment device of claim 101 wherein said distal portion comprises an  
expandable member.

103. The attachment device of claim 101 wherein said distal portion further comprises an antibiotic material coated on at least a portion of said distal portion.
- 5 104. The attachment device of claim 82 wherein said first portion comprises a distal end having a sharp tip located thereon.
105. The attachment device of claim 104 wherein said tip comprises a bioabsorbable material.
- 10 106. The attachment device of claim 82 wherein said securing device comprises a clip.
107. The attachment device of claim 106 wherein said clip is spring loaded.
- 15 108. The attachment device of claim 82 wherein said securing device comprises a screw.
109. An anchor for attaching to a stomach wall comprising:
- 20       a functional portion; and
- a securing portion operative to extend into the stomach wall in a direction substantially perpendicular to a plane of smooth stomach muscle contractions and thereby secure the attachment device to the stomach wall.
- 25 110. The anchor of claim 109 wherein said functional portion comprises a sensor.
111. The anchor of claim 110 wherein said sensor comprises an electrode
112. The anchor of claim 110 wherein sensor comprises a pH sensor.
- 30 113. The anchor of claim 110 wherein said sensor comprises a temperature sensor.

114. The anchor of claim 110 wherein said sensor comprises a pressure sensor.
115. The anchor of claim 110 wherein said sensor comprises a strain gauge.
- 5 116. The anchor of claim 110 wherein said anchor further comprises an electronic circuit including a telemetry circuit configured to communicate information sensed by said sensor to an external receiver.
- 10 117. The anchor of claim 116 wherein said electronic circuit comprises a battery, said battery being operative to power said circuit.
118. The anchor of claim 117 wherein said electronic circuit is configured to receive an inductively coupled power signal from an external source.
- 15 119. The anchor of claim 109 wherein said functional portion comprises a therapeutic device.
120. The anchor of claim 109 wherein said functional portion comprises a therapeutic agent delivery device.
- 20 121. The anchor of claim 109, wherein said securing portion includes an electrode located thereon.
122. The anchor of claim 121 further comprising electronic circuit configured to provide electrically stimulating pulses to a stomach wall through said electrode.
- 25 123. The anchor of claim 109 wherein said securing portion comprises a spring load clip.
- 30 124. The anchor of claim 109 wherein said securing portion comprises a screw.
125. The anchor of claim 109 wherein said securing portion comprises an expandable distal portion.

126. The anchor of claim 125 wherein said expandable distal portion comprises at least one laterally extending member.

5 127. The anchor of claim 126 wherein said at least one laterally extending member is configured to secure the anchor to the stomach wall.

128. The anchor of claim 126 wherein said at least one laterally extending member comprises an electrode located thereon.

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129. The anchor of claim 125 wherein said expandable distal portion comprises an inflatable member.

130. The attachment device of claim 125 wherein said expandable distal portion  
15 comprises a spring mechanism biased in an expanded position.

131. The anchor of claim 129 further comprising:  
an inflation lumen in fluid communication with said inflatable member and an  
inflation medium for inflating said inflatable member.

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132. The anchor of claim 131 wherein said inflation medium comprises a curable polymer.

133. The anchor of claim 125 wherein said expandable member is arranged to  
25 expand adjacent an outer surface of the stomach wall.

134. The anchor of claim 125 wherein said securing portion further comprises a bumper arranged to engage said attachment device so that said bumper abuts the inner surface of the stomach wall.

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135. The anchor of claim 109 wherein said securing portion comprises a distal end having a sharp tip located thereon.



136. The anchor of claim 135 wherein said tip comprises a bioabsorbable material.
137. The anchor of claim 109 wherein said attachment device is removably  
5 attachable to said stomach wall.
138. The anchor of claim 109 wherein said securing portion comprises a retaining portion arranged to prevent dislodgement of the anchor from the stomach wall.
- 10 139. The anchor of claim 138 wherein said retaining portion comprises an expandable distal end.
140. The anchor of claim 138 wherein said retaining portion comprises a bumper.
- 15 141. An anchor for attaching to a stomach wall comprising:  
a functional portion;  
a securing portion operative to extend into the stomach wall and thereby secure the attachment device to the stomach wall; and  
a retaining portion arranged to prevent dislodgement of the anchor from  
20 the stomach wall.
142. The anchor of claim 141 wherein said retaining portion comprises a spring portion arranged to bias said securing portion in a stomach engaging position.
- 25 143. The anchor of claim 141 wherein said securing portion comprises a clip.
144. The anchor of claim 141 wherein said securing portion comprises a staple.
145. The anchor of claim 141 wherein said securing portion comprises a suture.  
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146. An endoscopic instrument comprising:

an elongate tube comprising a proximal portion, a distal portion and a circumferential wall forming a first lumen sized to receive an endoscope therethrough; and

at least one instrument channel extending within the circumferential wall  
5 from the proximal portion to the distal portion and configured to receive an instrument therethrough.

147. An endoscopic instrument system for piercing a stomach wall comprising:  
a piercing needle; and  
10 an elongate member comprising a distal portion having a first axis; a lumen extending along a second axis parallel to said first axis; and a wall engaging portion located on said distal portion,  
wherein said piercing needle is arranged to extend through said lumen so that at said distal portion it is substantially parallel to said second axis so as to  
15 pierce the stomach wall in an orientation substantially perpendicular to said stomach wall.

148. The endoscopic instrument system of claim 147 wherein said wall engaging member is arranged to engage and hold tissue of a stomach wall.  
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149. The endoscopic instrument system of claim 148 wherein said wall engaging portion comprises a suction cup and a vacuum source operative to supply a vacuum pressure to said suction cup.

25 150. The endoscopic instrument system of claim 147 further comprising an anchor engaging instrument comprising an elongate member having a distal portion and an anchor engaging portion.

151. The endoscopic instrument system of claim 147 wherein said piercing  
30 needle comprises a hollow needle with a guide wire lumen extending therethrough said guide wire lumen for removably receiving a guide wire.

152. The endoscopic instrument system of claim 151 further comprising a guide wire and an anchor having a guide wire lumen extending therethrough, wherein when said hollow needle is removed from said guide wire, said anchor is arranged to advance over said guide wire.

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153. The endoscopic instrument system of claim 151 further comprising a sheath having a lumen extending therethrough, said lumen having an inner diameter configured to removably receive said piercing needle.

10 154. The endoscopic instrument of claim 153 further comprising an anchor having an outer diameter smaller than said inner diameter of said lumen so that said anchor may be advanced through said lumen.

15 155. The endoscopic instrument system of claim 154 further comprising an anchor engaging instrument comprising an elongate member sized to fit within the lumen and including an anchor engaging portion.

20 156. The endoscopic instrument system of claim 147 further comprising a sheath having a lumen extending therethrough, said lumen having an inner diameter configured to removably receive said piercing needle wherein said sheath comprises a dilator arranged to dilate an opening in the stomach wall.

157. An endoscopic instrument comprising:  
an elongate member having a proximal portion and a distal portion;  
25 at least one electrode located on said distal portion coupled to a conductor extending from said distal portion to said proximal portion;  
an electronic circuit comprising an input and an output, said input coupled to said conductor at said proximal portion, said electronic circuit configured to receive sensed electrical signals at said electrode and to output a signal  
30 representative of said sensed signal on said output.

158. An endoscopic system comprising:

an elongate stimulation member having a proximal portion and a distal portion; at least one electrode located on said distal portion coupled to a conductor extending from said distal portion to said proximal portion; and an electronic circuit comprising an output, said output coupled to said conductor at said proximal portion, said electronic circuit configured to deliver a stimulation signal to said electrode; and

a sensing member having a sensor operative to sense a response of a stomach wall to the stimulation signal.

10 159. The endoscopic system of claim 158 wherein said sensing member is located on said elongate stimulation member

160. The endoscopic system of claim 158 wherein said sensing member is located on an elongate sensing instrument.

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161. The endoscopic system of claim 158 wherein said sensing member comprises an endoscopic visualization portion.

162. The endoscopic system of claim 158 wherein said sensing member comprises a strain gauge.

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163. The endoscopic system of claim 158 wherein said sensing member comprises a pressure sensor.

25 164. A system for providing electrically stimulating signals to a stomach wall comprising:

a) a gastric stimulator including:

a housing having electronic circuitry contained therein and including an electrical conductor arranged to electrically couple at least one electrode to the electronic circuitry, wherein the electronic circuitry is configured to deliver electrically stimulating signals to the stomach wall through at least one stimulating electrode; and

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b) an attachment device operative to attach the housing to the inside of stomach wall;

c) an endoscopic delivery device comprising:

an elongate member having a proximal portion and a distal portion;

5 a stimulator engaging portion located at said distal portion of the elongate member, said stimulator engaging portion arranged to advance the gastric stimulator through an esophagus and towards an attachment site within the stomach.

10 165. The system of claim 164 further comprising at least one stimulating electrode located on the housing.

166. The system of claim 164 further comprising at least one stimulating electrode and an electrode attachment device arranged to attach the at least one  
15 electrode to the stomach wall; and

an endoscopic attachment instrument arranged to place the at least one electrode in an attached position on the stomach wall.

167. The system of claim 166 wherein the electrode attachment device comprises  
20 a first portion arranged to extend into the stomach wall.

168. The system of claim 167 wherein said first portion comprises an expandable distal portion arranged to secure the attachment device to the stomach wall.

25 169. The system of claim 167 wherein the at least one electrode is located on said first portion of the attachment device.

170. The system of claim 164 wherein said stimulator engaging portion comprises a releasable connector and wherein said stimulator further comprises a  
30 tool connector, said releasable connector arranged to releasably engage the tool connector for stimulator deployment.

171. The system of claim 164 wherein said attachment device is releasably attachable to the housing.
172. The system of claim 164 wherein the attachment instrument includes a guide  
5 coupled to the attachment device and wherein said housing includes a guide opening for receiving the guide.
173. The system of claim 172 wherein said guide comprises a tether.
- 10 174. The system of claim 172 wherein said tether is flexible.
175. The system of claim 172 wherein said guide comprises a guide wire.
176. A system for providing electrically stimulating signals to a stomach wall  
15 comprising:
- a) a gastric stimulator including:
    - a housing having electronic circuitry contained therein and including an electrical conductor arranged to electrically couple at least one electrode to the electronic circuitry, wherein the electronic circuitry is configured to deliver  
20 electrically stimulating signals to the stomach wall through at least one stimulating electrode; and
    - b) an attachment device operative to attach the housing to the inside of stomach wall; and
    - c) an endoscope comprising:  
25 an elongate member having a proximal end and a distal end;  
a stimulator engaging portion located at said distal end of the elongate member, said stimulator engaging portion arranged to advance the gastric stimulator through an esophagus and towards an attachment site within the stomach.
- 30 177. The system of claim 176 wherein said endoscope comprises visualization portion arranged to visualize a site on the inside of a stomach wall for attaching a stimulating device.

178. The system of claim 176 wherein said attachment device comprises an anchor, and wherein the endoscope further comprises an instrument channel extending from the proximal portion to the distal end of the elongate member; and wherein the anchor is sized to extend through the instrument channel in the  
5 endoscope for delivery to an attachment site on the inside of a stomach wall.

179. A system for attaching a functional device to a stomach wall comprising:  
an attachment device having a first portion arranged to extend into the stomach wall when said attachment device is attached to the stomach wall; and  
10 an endoscopic delivery device comprising:  
an elongate member having a proximal end and a distal end;  
an attachment device engaging portion extendable through a lumen extending through said elongate member, said attachment engaging portion arranged to advance the attachment device through an esophagus and towards an  
15 attachment site within the stomach.

180. The system of claim 179 further comprising a functional device.

181. The system of claim 180, wherein said attachment device is releasably  
20 attachable to the functional device.

182. The system of claim 179 further comprising a functional device engaging tool wherein said functional device engaging tool comprises a releasable connector and wherein said functional device further comprises a tool connector,  
25 said releasable connector arranged to releasably engage the tool connector for functional device deployment

183. The system of claim 179 wherein said attachment device comprises:  
an expandable distal portion coupled to said first portion, said expandable distal  
30 portion arranged to secure the attachment device to the stomach wall.

184. The system of claim 180 further comprising a guide coupled to the attachment device and wherein said functional device includes a guide opening for receiving the guide.

5 185. The system of claim 184 wherein said guide comprises a tether.

186. The system of claim 184 wherein said guide comprises a guide wire.

187. A gastric stimulation device comprising:

10       housing means for containing electronic circuit means;  
          electrode means coupled to the housing means and electrically coupled to the electronic circuit means;  
          electronic circuit means for delivering electrically stimulating signals to the stomach through said electrode means; and  
15       an attachment means for attaching said housing means within a stomach cavity to a stomach wall so that said electrode means is in electrical contact with the stomach wall.

188. The gastric stimulation device of claim 187 wherein said electrode means  
20 comprises at least one pair of bipolar electrodes, said stimulation device further comprising adjustable means for adjusting a distance between said bipolar electrodes.

189. The gastric stimulation device of claim 187 further comprising a release  
25 means for latching and unlatching said housing means with said attachment means.

190. The gastric stimulation device of claim 187 further comprising a  
disengaging means for disengaging said attachment means from the stomach wall.  
30

191. The gastric stimulation device of claim 187 further comprising expandable means for securing said attachment means to the stomach wall.



192. The gastric stimulation device of claim 187 wherein said electronic circuit means comprises telemetry means for sending or receiving a telemetry signal.

5 193. The gastric stimulation device of claim 187 further comprising a patient control means for controlling the electronic circuit means through said telemetry means.

194. The gastric stimulation device of claim 182 further comprising a control means for transmitting a telemetry signal to said telemetry means.

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195. The gastric stimulation device of claim 187 further comprising an electrode anchor means for anchoring said electrode means to a stomach wall so that said electrode means is in electrical contact with said stomach wall.

15 196. The gastric stimulation device of claim 187 further comprising an electrically coupling means for electrically coupling said electrode means to said housing means.

197. A gastric stimulation device comprising:

20 a corrosion resistant housing means for containing electronic circuit means;

electronic circuit means for delivering electrically stimulating signals to the stomach through an electrode means, said electronic circuit means comprising a connector means for electrically coupling the circuit means to an electrode

25 means; and

a corrosion resistant sealing means for sealing said connector means from the stomach environment.

30 198. The gastric stimulation device of claim 197 further comprising an attachment means for securing said housing to the stomach wall from within stomach cavity.

199. A gastric stimulation device comprising:

an anchor means for attaching an electrode to a wall of a stomach from within a stomach cavity.

200. The gastric stimulation device of claim 199 wherein said anchor means  
5 comprises an expandable means for securing the anchor to a stomach wall.

201. The stimulation device of claim 200 wherein said anchor means comprises and electrode means located thereon.

10 202. A gastric stimulation device comprising:  
housing means for containing electronic circuit means;  
electrode means coupled to the housing means and electrically coupled to  
the electronic circuit means;  
electronic circuit means for delivering electrically stimulating signals to  
15 the stomach through said electrode means; and  
an attachment means for attaching said housing means within a stomach  
cavity to a stomach wall so that said electrode means is in electrical contact with  
the stomach wall; and  
a sensing means for sensing a parameter indicative of a condition of the  
20 stomach.

203. The gastric stimulation device of claim 202 further comprising a control  
means for controlling the stimulation signals based on a parameter sensed by said  
sensing means.

25 204. An attachment means for attaching a functional device means to a stomach  
wall comprising:  
a securing means for securing the attachment means to a stomach wall; and  
a coupling means for receiving and coupling said functional device means  
30 to said attachment device means.

205. The attachment means of claim 204 further comprising a releasable latch means for latching and unlatching said coupling means from a coupled engagement with a device attached to said attachment means.
- 5    206. The attachment means of claim 204 further comprising a release means for releasing said attachment means from engagement with a stomach wall.
207. The attachment means of claim 204 wherein said securing means is arranged to secure said attachment means in a substantially perpendicular orientation with  
10    respect to the natural orientation of the stomach wall.
208. The attachment means of claim 204 further comprising an expandable means for securing said attachment means to a stomach wall.
- 15    209. The attachment means of claim 208 wherein said expandable means comprises an inflatable means for sealingly securing said expandable means adjacent an outer surface of a stomach wall.
210. The attachment means of claim 204 further comprising a bumper means for  
20    engaging the attachment device so that said bumper means abuts an inner surface of a stomach wall.
211. An anchor means for anchoring a functional means to a stomach wall comprising:  
25        a securing means for extending into a stomach wall to secure said anchor means to; and  
          a functional means for treating or sensing a condition of a stomach.
212. The anchor means of claim 211 wherein said functional means comprises a  
30    sensing means for sensing a parameter indicative of a condition of a stomach.
213. The anchor means of claim 211 wherein said functional means comprises a therapeutic means for treating said stomach.

214. The anchor means of claim 211 further comprising a release means for releasing said attachment means from engagement with a stomach wall.
- 5    215. The anchor means of claim 211 wherein said securing means is arranged to secure said anchor means in a substantially perpendicular orientation with respect to the natural orientation of the stomach wall.
- 10    216. The anchor means of claim 211 further comprising an expandable means for securing said attachment means to a stomach wall.
- 15    217. The anchor means of claim 216 wherein said expandable means comprises an inflatable means for sealingly securing said expandable means adjacent an outer surface of a stomach wall.
- 20    218. The attachment means of claim 211 further comprising a bumper means for engaging the anchor device so that said bumper means abuts an inner surface of a stomach wall.
- 25    219. An endoscopic instrument system for piercing a stomach wall comprising:  
        a piercing means for piercing the stomach wall in an orientation substantially perpendicular to said stomach wall; and  
        a lumen means receiving said piercing means said lumen means having an axis substantially parallel to said piercing means for receiving said piercing means  
        therethrough, and having a wall engaging means for engaging and holding a  
        portion of a stomach wall to be pierced by said piercing means.
- 30    220. The endoscopic instrument system of claim 219 wherein said wall engaging means comprises a vacuum means for applying a vacuum to a region of the stomach wall to be pierced.
221. The endoscopic instrument of claim 219 wherein said piercing means comprises means for advancing over a guide wire, said instrument further

comprising a guide wire means for removably receiving said piercing means and for removably receiving an anchor means for anchoring in a stomach wall.

222. The endoscopic instrument of claim 219 wherein said instrument further  
5 comprises a sheath means for removably receiving said piercing means, said sheath means for receiving an anchor means for anchoring in a stomach wall.

223. An endoscopic instrument system comprising:  
an elongate instrument means for accessing the inside of a stomach wall  
10 through an esophagus, said elongate instrument means having a distal portion; and  
an electrical signal sensing means for sensing electrical activity of a stomach wall, said electrical signal sensing means located on said distal portion of said elongate instrument means.

15 224. An endoscopic instrument system comprising:  
an elongate instrument means for accessing the inside of a stomach wall through an esophagus said elongate instrument means having a distal portion;  
an electrical stimulating means for electrically stimulating a stomach wall, said stimulating means located on said distal portion of said elongate instrument  
20 means; and  
a sensing means for sensing response of the stomach wall to electrical stimulation.

225. The endoscopic instrument system of claim 224 further comprising an  
25 adjusting means responsive to said sensing means, for adjusting parameter of stimulation applied to said stomach in response to a sensed response of the stomach wall to the electrical stimulation.

226. A method of stimulating a stomach wall comprising the steps of:  
30 providing a gastric stimulator including a housing containing electronic circuitry therein, wherein said electronic circuitry is arranged to deliver electrically stimulating signals to the stomach wall through at least one stimulating electrode;

providing an attachment device for attaching the stimulator to the stomach wall;  
providing at least one stimulating electrode;  
advancing the gastric stimulator through the esophagus of a patient and  
5 towards an attachment site within the patient's stomach;  
attaching the stimulator device to the attachment site with the attachment device.; and  
placing said at least one stimulating electrode in electrical contact with the stomach wall, whereby the at least one stimulating electrode is coupled to the  
10 electronic circuitry.

227. The method of stimulating a stomach wall of claim 226 further comprising the steps of:  
providing an endoscope including a device for identifying a site for  
15 attaching the stimulator to the stomach wall; and  
identifying the attachment site with the endoscope before  
attaching the stimulator device to the attachment site with the attachment device.

228. The method of stimulating a stomach wall of claim 226 further comprising  
20 the steps of:  
providing a stimulator engaging device; and  
advancing the gastric stimulator through the esophagus and towards an attachment site within the stomach with the stimulator engaging device.

25 228. A method of attaching a functional device to a stomach wall comprising the steps of:  
providing a functional device;  
providing an attachment device for attaching the functional device to the stomach wall;  
30 advancing the attachment device through a patient's esophagus and towards an attachment site within the stomach;  
attaching the attachment device to the attachment site;  
advancing the functional device to the attachment device; and

coupling the functional device to the attachment device.

229. The method of claim 228 further comprising the steps of:

5       providing the functional device with an actuating circuit configured to  
actuate the functional device; and  
      actuating the functional device by way of a control signal from said  
actuating circuit to provide a functional response by the functional device.

230. The method of claim 229 further comprising the steps of:

10       providing a telemetry circuit coupled to the actuating circuit; and  
      delivering a telemetry signal to the telemetry circuit to cause generation of  
the control signal.

231. A method of attaching a functional device to a stomach wall comprising the  
15 steps of:

      providing an anchor including a functional portion and a securing portion;  
      advancing the anchor through the esophagus and towards an attachment  
site within the stomach; and  
      attaching the anchor to the attachment site so that the securing portion does  
20 not substantially constrain the stomach in the plane of smooth muscle  
contractions.

232. The method of attaching a functional device to a stomach wall of claim 231  
wherein the step of attaching the anchor to the attachment site comprises attaching  
25 the securing portion substantially perpendicular to the plane of the stomach wall.

233. The method of attaching a functional device to the stomach wall of claim  
231 further comprising the step of providing the anchor with an expandable distal  
end;

30       wherein the step of attaching the anchor to the attachment site further  
comprises piercing the stomach wall and expanding the expandable distal end to  
secure the anchor to the stomach wall.

234. A method of attaching a stimulating electrode to a stomach wall comprising the steps of:

- providing an anchor including a securing portion;
- advancing the anchor through a patient's esophagus and towards an
- 5 attachment site within the stomach;
- attaching the anchor to the attachment site;
- providing an electrically stimulating electrode;
- advancing the electrically stimulating electrode through the esophagus and
- towards the anchor within the stomach;
- 10 coupling the electrically stimulating electrode to the anchor so that the
- electrode is in electrical contact with the stomach wall.

235. A method of attaching a stimulating electrode to a stomach wall comprising the steps of:

- 15 providing an anchor including a securing portion and an electrically
- stimulating electrode
- advancing the anchor through the esophagus and towards an attachment
- site within the stomach; and
- attaching the anchor to the attachment site so that the electrode is in
- 20 electrical contact with the stomach wall.

236. A method of attaching a stimulating electrode to a stomach wall comprising the steps of:

- providing an anchor including a securing portion;
- 25 advancing the anchor through the esophagus and towards an attachment
- site within the stomach; and
- attaching the anchor to the attachment site;
- providing an electrically stimulating electrode;
- advancing the electrically stimulating electrode through the esophagus and
- 30 towards a stimulating site within the stomach;
- attaching the electrically stimulating electrode to the stimulating site so
- that the electrode is in electrical contact with the stomach wall.